Mums, Babies and Blood

Case Studies

Cambridge University Hospitals NHS Foundation Trust

Together
Safe
Kind
Excellent

Author's name: Ruth Smith

Author's title: Transfusion Practitioner for the Rosie Hospital.

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Case Study 1:

Patient R

Booked in for her 4th pregnancy in June 2020.

Blood Group: O RhD Positive

1st pregnancy (2014) Stillbirth-no cause established

2nd pregnancy (2015) Uncomplicated pregnancy. No antibodies detected up to and including delivery.

3rd pregnancy (2016) Booking bloods showed positive antibody screen, due to anti-c. Quantitation 0.8 IU/ml.

Partner was tested and found to be homozygous for the c antigen, therefore all children from this partnership would be c positive.

Antibody levels monitored according to protocol, and by 34 weeks the level had risen to 23.1 IU/ml (High risk). Steroids given, and IOL at 36+4. SVD, baby sent to NICU, had phototherapy and discharged at 10 days.

Text slide 1 column

So, when she returned in June 2020, the Foetal Medicine Unit, Obstetricians and transfusion teams knew what to expect!

Booking level at 13 weeks gestation: 5.3 IU/ml. (Low risk)

Foetal genotyping confirmed that the baby was c positive.

By 24 weeks gestation, the anti c level had risen to 11.3 IU/ml (Medium risk), and by 32 weeks to 18.8 IU/ml. (Still medium risk).

At 34 weeks, a routine Middle Cerebral Arterial Doppler showed a Peak Systolic Velocity of 1.86 MoM indicating there was a high risk that the baby was anaemic.

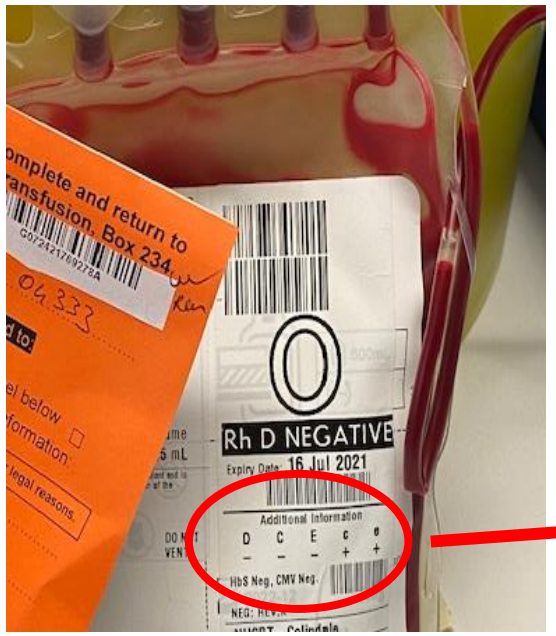
The following day, mother was admitted, and steroid injections given in preparation for IOL.

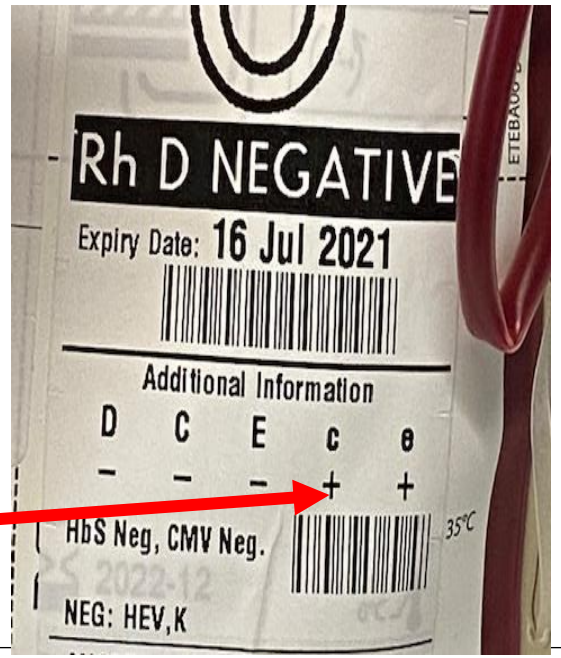
Scenario: Due to IOL, Multiparity, Age, Obstetric history and BMI of 44, Mum was at increased risk of bleeding. Due to antibody, mum requires full crossmatch (45 minutes).

Baby also predicted to be anaemic due to HDFN.

Problem: Neither can receive the Emergency O RhD Negative units

Why????





Plan put in place involving Obstetricians, transfusion team, NICU.

Prior to IOL, 4 units cross-matched and sent over to delivery unit.

Alert put in place that emergency O RhD negative units NOT to be used.

On IOL, a further 4 units of red cells cross-matched and sent over.

Laboratory aware to monitor blood use, so more blood could be made available in a timely manner

Full paedipack cross-matched against mums plasma, labelled as compatible for “baby of patient R” and sent over to delivery unit.

National blood service alerted to hold a suitable unit in case an exchange transfusion was required.

Outcome:

Baby boy delivered by caesarean section (failed IOL) at 34+2 weeks gestation.

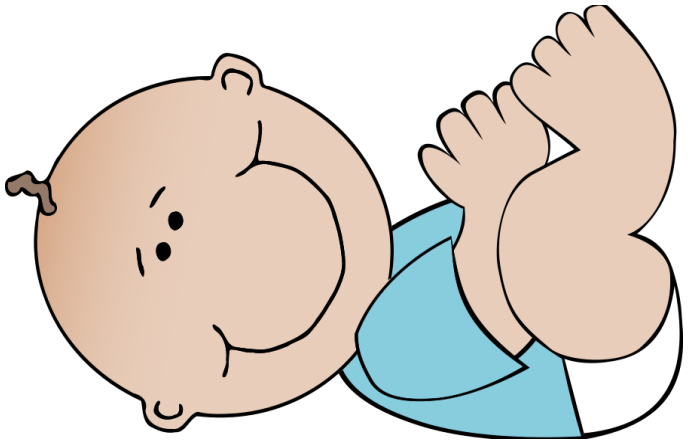
Haemoglobin 165g/l, Bilirubin 56µmol/l

Baby received double phototherapy, which was reduced to single on day 2.

Bilirubin under treatment threshold by end of day 2, so treatment stopped and levels monitored.

Baby discharged home on day 17.

No blood required by mother or baby!



Case study 2

Patient K

3rd pregnancy. 2 previous uncomplicated pregnancies 12 years and 9 years earlier, Blood Group B RhD Negative, no history of antibodies.

Referred from local hospital, as the 10 week booking sample showed an anti D level of 1.7 IU/ml. (Immune)

Documented that anti D had been administered at delivery on both previous pregnancies, and there had been no transfusions and no miscarriages or terminations.

At 16 weeks, the level had risen to 10.1 IU/ml (medium risk) so referred to the Foetal Medicine Unit.

Unsurprisingly, foetal genotyping predicted the baby to be RhD positive.

By 24 weeks gestation, the level had risen to 15.5 IU/ml, placing baby in the high risk group for HDFN. At this point, all baby scans were fine.

At 28 weeks the anti D level was 25.9 IU/ml-MCA Doppler still fine.

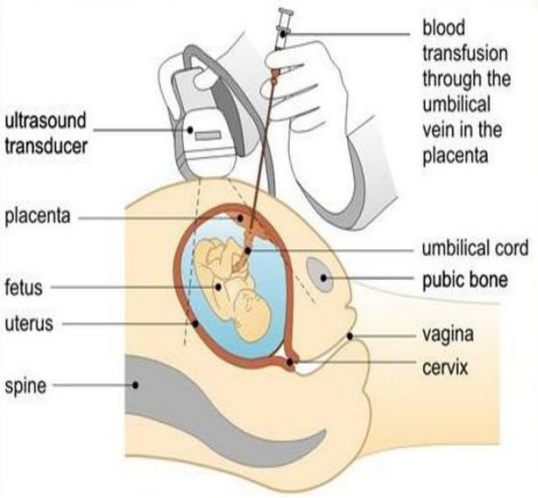
However, at 30 weeks anti D level was 27.1 IU/ml, but the MCA Doppler showed a PSV at >1.5 MoM.

Mother referred to Kings College Hospital, London for Intra Uterine Transfusion.

10 days after IUT, PSV had once again risen to >1.5 MoM, so a further IUT was carried out 5 days later.

8 days after the second IUT the PSV was again above 1.5 MoM so plans were made to deliver the baby 2 days later by caesarean section at 34 weeks gestation.

It was decided (fortunately) to have blood for an exchange transfusion cross-matched and available.



Outcome:

Baby girl was delivered with a haemoglobin level of 105g/l (normal range 142-217g/l), and bilirubin level of 144µmol/l, which put her above the treatment threshold for exchange transfusion.

Cord bloods were taken for grouping, Mum was duly given anti D and a sample taken for FMH.

A double exchange transfusion was carried out, followed by triple phototherapy. Unfortunately, the bilirubin rose above the treatment threshold again, so a further double exchange transfusion was performed followed at 12 hours of age by double phototherapy, reducing to single at the beginning of day 3. Phototherapy was stopped at the end of day 3.

On day 4, she was transferred to her local hospital, where she received 2 further top-up transfusions. At her 16 week check up back at Addenbrookes, she appeared to be fine.

So, on the surface, everything seems to have gone well, but there were near misses, e and lessons learned along the way……

Learning points:

1. How did the mother come to have immune anti D in the first place when she received prophylaxis after her previous delivery?

   Unsure. ? Large FMH towards end of previous pregnancy not picked up.

   ?Large FMH at delivery and insufficient anti D administered.

   ? Undocumented TOP/miscarriage

   ? Raised BMI, so anti D did not work efficiently (No)

   ? Anti D given within correct time frame (unsure)

In rare cases, even though all guidelines are followed, mothers can still become sensitised.

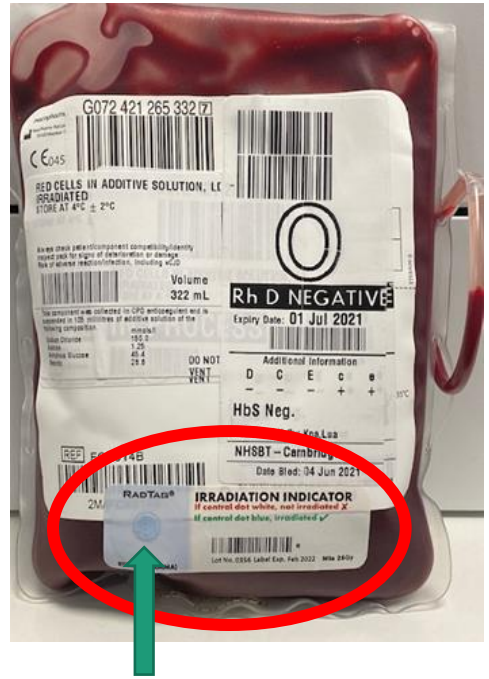
2a Communication.

Blood Transfusion Laboratory IT system is separate from that used in the rest of the hospital, meaning that sometimes important information is not readily available.

Blood Transfusion Laboratory unaware that baby K had had 2 IUTs. If baby has received an IUT, they require irradiated blood for transfusion until 6 months post EDD.

Blood for exchange transfusion is always irradiated (unless absolute emergency), whereas for top-up transfusions it is not, so therefore needs to be specifically requested.

If blood for top-up transfusion only had been requested, laboratory would have supplied non-irradiated units.



2b Laboratory confused as cord bloods taken at delivery grouped as O RhD negative.

?? Had samples been mislabelled (Mum/cord)-No

?? Was the foetal genotyping incorrect- No

Notes interrogated-found evidence of IUT-explains findings, but baby group should actually be recorded as unknown.

Improvement since:

Transfusion laboratory team, along with myself and the transfusion consultant regularly review antenatal patients with antibodies, and liaise with antenatal/foetal medicine teams and obstetric consultants regarding transfusion care for those patients.

3. Error with anti D administration.

At delivery, mother was given anti D and had an FMH sample taken.

Both unnecessary as mother was already sensitised. (SHOT reportable)

However, laboratory recognised that their method of reporting anti D at the time was not clear as it did not differentiate between immune and passive anti D.

Important, until an anti D has been confirmed as definitely immune, the mother should continue to receive prophylaxis if foetal RhD type is unknown or predicted positive.

Laboratory now have 3 different anti D reports:

Anti D – Immune (Anti D prophylaxis not required)

Anti D – Passive

Anti D – Unknown

Thank you for listening….

……Any Questions???

r.smith@addenbrookes.nhs.uk Tel: 01223 217072